STARVATION

focus

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Human Starvation

To starve, according to the dictionary, means "to perish with hunger," to be in a state of want. As this definition sets no time limit during which death will occur, it is justifiable to say that two-thirds of the world is starving.

Starvation can be total or partial. If total, that is if no nutritive substance reaches the cells of the tissues from the outside world, death ensues after a few weeks. However, if some of the necessary nutrients do reach the tissues, it may be several years before death occurs.

The growth and upkeep of our tissues are ensured by the daily arrival of certain chemical elements: proteins, carbohydrates, fats, minerals, and vitamins. Each of these has a definite role in maintaining the life of the tissues and their functions. If these elements continuously fail to be provided in adequate amounts, diseases inevitably occur.

Foods have another role. They provide energy (measured in calories), which results from the combustion and utilization of the food molecules in the body. Adequate energy can be supplied without adequate sustenance of the tissues. On the other hand, if you have enough tissue-sustaining elements in your diet, the calories for energy will take care of themselves.

As the map shows, in many areas of the world enough energy is supplied. People do not feel their hunger: the want is concealed. They go about their business, though inefficiently. Their tissues are not getting the protective elements they need to survive. Starvation is partial, but premature death is certain.

Among the elements of the diet the proteins are by far the most important. There are many varieties of protein molecules. Some of them, called "essential," cannot be synthesized in the body from external elements and must be supplied ready-made. Proteins are graded as of high or low biological value, according to their wealth in these essential molecules. Animal proteins belong to the highest category, and because of this, it is considered that a healthy diet should contain from one-fifth to one-third of its daily protein ration in animal form. In general, animal proteins are expensive.

Carbohydrates, on the other hand, are inexpensive, and since they generate a large number of calories, they are a cheap source of energy and hence are popular. Fats are also a concentrated source of energy, and their slow metabolic process delays the onset of hunger. Minerals are found in almost all foods in different amounts. The importance of some trace elements is suspected but not understood. Vitamins are essential in minute amounts, for some mysterious reason, to sustain life in human tissues.

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Obviously, the minimal requirements of a human body to preserve nutritional health vary with age, sex, and physical stress. The amount of energy needed also varies. The calorie requirements of a small-sized Tamil worker in the harbor of Madras are different from those of a big-boned Canadian lumberman. Because of this, what might be starvation under certain conditions may not be under others.

With these basic facts in mind let us see how the world eats. There is a great difference between the diets that a land can produce (carrying capacity), what it does produce (food available), and what the individual ingests (food consumed).

The carrying capacity is the amount of human, animal, and vegetable life that the land and the waters connected with it can support. Technically, it has been defined (by Vogt) as the ratio between the biotic capacity and the environmental resistance. This is a potential figure. It has to take into consideration such variables as soil, technology, and manpower. The *actual* carrying capacity of a land is based on these factors as they exist now. In some countries, such as India, the maximum carrying capacity has apparently already been reached, under present technology, and as the population increases, the individual's ration necessarily becomes smaller. In other countries, such as France, the carrying capacity is commensurate with the people it has to serve. In still other regions, such as parts of Indonesia, it probably could be increased to meet present or future needs. But ecological, social, and economic factors would have to be carefully considered before breaking—with the best of intentions—an established relationship.

The amount of food available per capita per day depends upon the actual carrying capacity of a region, the number of people to share its products, and the food imports. These figures are known by country per year, and the daily available ration could be computed—if all the other factors were equal.

But all of the other factors are not equal, and the amount of food consumed is very different from the amount available. These other factors are chiefly social, economic, and cultural. Thus a large number of variables govern the factors that in turn condition the various human diets.

In about 50 per cent of the countries of the world the data show quantitatively what the average inhabitant eats every day the year round. For the other 50 per cent of the world's countries we have only qualitative information. From a screening of this data we have been able to classify each country in one of three categories of diets: adequate, partly inadequate, and totally inadequate. The partly inadequate areas are those where the diet contains sufficient calories but insufficient tissue-repair elements.

As the map clearly shows, the starving two-thirds of mankind live mostly in the tropical and subtropical belts.

It is fairly easy to discover *where* people are starving. To find out *why* they are starving is more difficult. In some of the starving countries there is—if figures are correct—enough food available. In others there is a basic scarcity: enough food just is not there. Thus the starving countries of the world fall into two groups: the use-nots and the have-nots. Obviously there are many causes of starvation, not merely one.

In the have-not countries the carrying-capacity law of the land has been broken. The soil is milked of more than it can produce. Some of the reasons for this disruption stem from the environment. Such disruptions may be occasional or permanent; but in some regions the occasional environmental catastrophes occur so often that they are almost a feature of the region. For decades this was the case in China, where parts of the country experienced every year severe droughts and floods; and despite the large and numerous water control projects carried out in recent years, both droughts and floods still occur all too often.

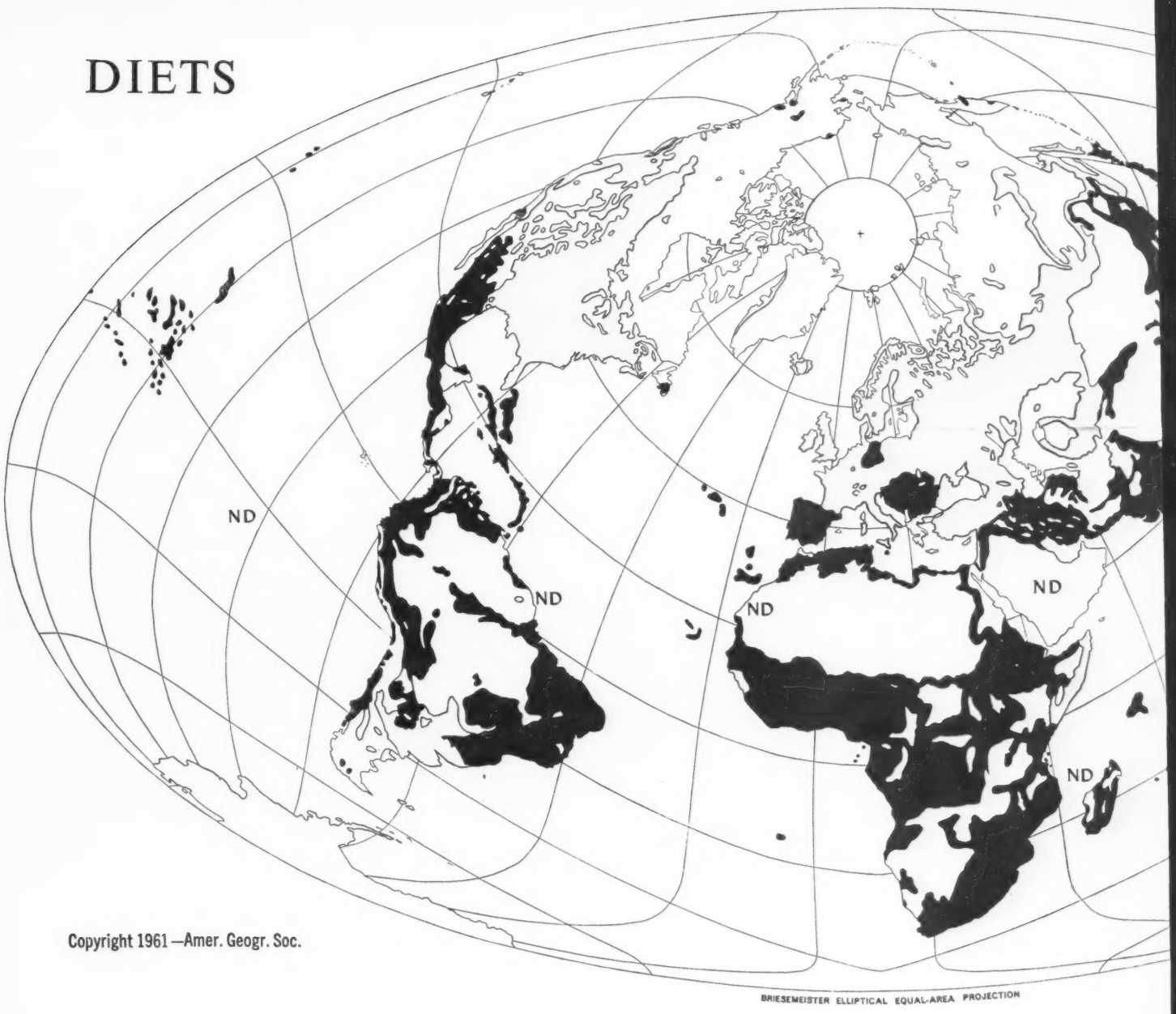
The carrying capacity of the land can be lowered by permanent disruptions, such as natural erosion. Locusts and other pests limit in a regular fashion the productivity of the land, as they do in China and parts of the Middle East, for instance.

Other disruptions of the carrying capacity of the land stem from the human element. Foremost among these is overpopulation, the most glaring examples of which are China, India, Pakistan, and Egypt.

The social structure of a society, again chiefly exemplified in India, is a serious cause of food shortage. In some places the customs governing inheritance divide and subdivide the land to such a point that it is not soundly workable. Yet people refuse to migrate because they have heard frightening tales about foreign lands, or because there are no better places within reach, or because they cannot afford transportation, or are bound by religious beliefs to stay at home.

In many regions poor technology has broken the

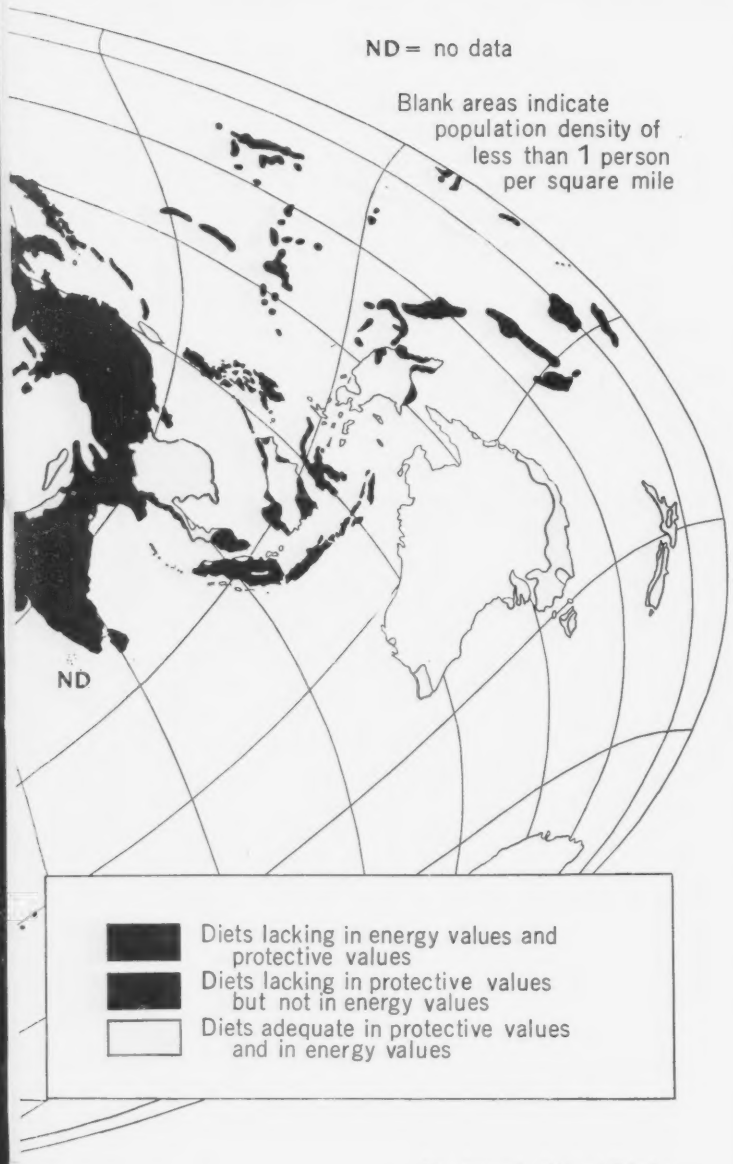
DIETS



law of the carrying capacity of the land or is on the verge of breaking it in a conceivably near future. In India, Mexico, certain parts of Africa, and the Caribbean islands there is competition between men and animals for the food produced, and so both starve. In the Lake Chad region, in many other parts of Africa, and in the Caribbean, cattle are currency, a sign of wealth, a local means of exchange. Eating a cow would be like eating one's capital. Also as a result of this concept little is done to increase milk supply, and this source of food is not explored.

In other places—and they are many—poor farming methods do not get out of the land as much food as might be produced. Poor technology is also the cause of man-made erosion, which is sending to the bottom of the ocean topsoil that should feed future generations. Some people in the United States have been guilty of this when they applied machines to lands that required a more motherly care.

If we now turn to the use-nots, we find a surprising list of countries, and a no less surprising number of possible causes for the failure to take advantage


ND = no data
Blank areas indicate population density of less than 1 person per square mile
ND
Diets lacking in energy values and protective values
Diets lacking in protective values but not in energy values
Diets adequate in protective values and in energy values

Map drawn by Vincent Kotschar

of the produce of the soil. Plenty of food is theoretically available in Colombia, Venezuela, Brazil, Eastern Germany, the new nations of tropical western Africa, the Republic of the Congo, Indonesia, and elsewhere.

In some countries, such as Brazil, the transportation facilities are inadequate: food cannot be brought from one province to the other when needed. In Colombia, except for the Magdalena Valley, a peculiar setup leads to semi-starvation. Much land is used as a security against inflation and not as a food producer. Also, good land is used for cattle grazing on an inefficient basis, while most food crops are grown on small farms, often on steep slopes and in poor soil.

Another and obvious reason for hunger is poverty: people do not have the money to buy the food they need. This poverty may be the result of many factors, not least of which may be the mortgage system, which sometimes forces the farmer to raise cash crops instead of food on his tiny parcel of land to meet the ever-growing interest on a loan lest he be evicted.

Religious taboos also play a large role. People starve in India rather than kill a cow, or eat the flesh of one that dies, or even eat corned beef—as some of us probably would starve if we had to feed on dog meat, worms, or rats, which are commonly eaten in parts of Southeast Asia.

In certain places hunger is fostered by absentee ownership of large estates, which forces tenants or laborers to raise cash crops instead of food. This occurs widely in South America.

There is no doubt that in certain countries the political setup is conducive to hunger. Where the state, which is the absentee owner in such countries, takes away from the people the food they have produced and fails to redistribute it in balanced quantities, some people starve.

In many places a variety of these factors leading to starvation combine, such as in the famine lands of India. There you find together overcrowding, ex-

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haustion of the arable land, poor farming techniques, cultural taboos, poverty, social and economic restricting cultures, and lack of capital.

The problem of overpopulation is a complex one. Certainly population balances that seemed to take care of themselves in the past, are apparently rather out of control at present. This may, however, be an illusion. In previous centuries the inhabited world was not as extensive as it is now, and the relationship between land and people may have been the same. Epidemics and wars of the past may have been more effective than now in checking population growth. Until recently some people felt that we might expect stabilization of the birth rate through raising the standard of living. This does not seem to be the case. Present methods of birth control are relatively expensive, and the principle is not acceptable to many. Where it could do the most toward improving the life of those who are born, it seems difficult to implant. Breeding gives men the illusion of a hold on eternity, a new chance for happiness. To persuade people to give up these two basic grips on life is a tall order. There is also the anxious question. "Will the other nation adopt birth control too?"

Then we are faced with the odd dilemma of what to do with our recently acquired medical knowledge and its frightening power to preserve more and more people for a less and less desirable life.

The problem of soil conservation is no less complex. It costs time, knowledge, and money to diagnose erosion, and money, knowledge, and time to combat it. Such are not available where they are most needed. Good husbandry and balanced farming techniques are arts that have reached a point of perfection in only a few privileged areas. In the starving regions pressure of population has often prevented their adoption.

Modern Western technology may not be the answer for such places. An effort to develop such techniques might be a tragic mistake resulting in agricultural annihilation and complete economic disruption. Industrial agriculture in overpopulated countries, even if financially possible, would spell unemployment for millions and upset the social structure in a way that might do more harm than good.

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